AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

Listing of the claims

Claims 1 – 19 (Cancelled)

Claim 20 (Currently Amended): A method of determining the salinity of liquids by standard calibrated measurements of the electrical conductivity of a heated liquid sample in a measuring cell, comprising the steps of:

~~arranging~~providing the measuring cell in a constantly cooled and mechanically stirred as well as heatable water bath insulated to the exterior under control parametric consideration of the thermal conditions in the water bath;

measuring with a thermometer the actual temperature (ϑ_B) as an equivalent of the temperature (ϑ_p) of the sample at a high repetitive accuracy and with a maximum permissible lag error ($\Delta\vartheta_{max}$) between the temperature of the water bath and sample temperature (ϑ_B, ϑ_p) set by the required accuracy of determining the salinity (S), ~~the~~a control parameter for taking into account the thermal conditions being the time-wise drift ($\alpha = \Delta\vartheta_B/t$) of the temperature ($\vartheta_B$) derivable from the temperature measurements, the permissible maximum value (α_{max}) of which is defined as the quotient ($\alpha_{max} = \Delta\vartheta_{max}/_T$) of the maximum permissible lag error ($\Delta\vartheta_{max}$) and a time constant ($_T$) of the measuring cell (MC) for a temperature equalization between the interior of the measuring cell and the water bath (WB), and

controlling with a control device the permissible maximum value of the time-wise drift (α_{max}) of the temperature (ϑ_B) of the water bath by maintaining a low-lag and quickly controllable compensation of the heat currents (P±) flowing into and out

of the water bath (WB) such that the resulting quantity of the residual heat current (P_{rest}) does not exceed a predetermined maximum value ($P_{restmax}$).

Claim 21 (Previously Presented): The method of claim 20, further comprising the step of maintaining the temperature (ϑ_B) of the water bath by the resultant residual heat current (P_{rest}) at the mean ambient temperature approximately with a deviation of $\pm$ 1 K.

Claim 22 (Previously Presented): The method of claim 21, further comprising the step of utilizing the energy input into the water bath (WB) by the stirring (P_R) for the quick and low-lag controllable heating (P_H) thereof.

Claim 23 (Previously Presented): The method of claim 22, further comprising the step of providing high heat resistance (R) of the exterior insulation (I) of the water bath (WB).

Claim 24 (Previously Presented): The method of claim 23, further comprising the step of providing water bath cooling (PE) of high heat resistance (R) on the side of the bath.

Claim 25 (Previously Presented): The method of claim 24, further comprising the step of adjusting the temperature of the liquid sample (ϑ_p) to the temperature (ϑ_B) of the water bath in a separately controlled advance bath (PB).

Claim 26 (Previously Presented): The method of claim 25, further comprising the steps of carrying out the measuring sequence automatically by a computer (PC) and of calculating the salinity (S) of the liquid sample (PROBE) from the measured values of temperature (ϑ_B) and conductivity ($_K$) on the basis of the UNESCO formula.

Claim 27 (Previously Presented): An apparatus for determining the salinity of liquids by standard calibrated measurements of the electrical conductivity of a heated liquid sample, comprising:

a vial for holding a sample of the heated liquid;

a measuring cell arranged in a water bath;

means for transferring the heated liquid from the vial to the measuring cell;

means in the water bath for cooling, stirring and heating;

a heat exchanger;

insulation means disposed at an external wall of the water bath;

a control device for controlling the actual temperature (ϑ_b) of the water bath at high repetitive accuracy and at a maximum permissible lag error ($\Delta\vartheta_{max}$) between the water bath and sample temperature (ϑ_b, ϑ_p) determined by the accuracy demanded by the determination of salinity (S) as the equivalent of the temperature (ϑ_p) of the sample, the control parameter for taking into account the thermal conditions being the time-wise drift ($\alpha = \Delta\vartheta_B/t$) of the temperature ($\vartheta_b$) of the water bath the permissible maximum value (α_{max}) of which is defined as the quotient ($\alpha = \Delta\vartheta_{max}/_T$) of the maximum permissible lag error ($\Delta\vartheta_{max}$) and a time constant ($_T$) of the measuring cell (MC) for a temperature balancing between the interior of the measuring cell and the water bath (WB), and

means for low-lag and quick adjustment of heat currents (P±) flowing into and out of the water bath (WB) for maintaining a permissible maximum value of the time-wise drift (α_{max}) of the temperature (ϑ_b) of the water bath such that the quantity of the resulting residual heat current (P_{rest}) does not exceed a corresponding predetermined maximum value ($P_{restmax}$), and

a precision thermometer (TM) having a long term stability of less than 1 K per year and a time constant of less than .5 s for directly measuring the actual temperature ($\Delta\vartheta_B$) of the water bath (WB).

Claim 28 (Previously Presented): The apparatus of claim 27, wherein the precision thermometer (TM) is provided with temperature dependent semiconductor resistors.

Claim 29 (Previously Presented): The apparatus of claim 28, wherein the means for stirring provided for stirring and heating the water bath (WB) is structured as a rotationally controllable stirring propeller (Q) having a stirring vane (SP) similar to a ship's screw of high hydrodynamic efficiency which and is rotatable by a continuously controllable electric motor (EM) arranged at the exterior of the water bath (WB).

Claim 30 (Previously Presented): The apparatus of claim 29, wherein at least one Peltier element provided with a thermal insulation (I) at the cooling side of the water bath (WB) is arranged at the wall of the water bath (WB).

Claim 31 (Previously Presented): The apparatus of claim 30, wherein the measuring cell (MC) is provided with strip electrodes (SE) and has a volume in the range of 2 ml.

Claim 32 (Previously Presented): The apparatus of claim 31, wherein a separate controllable advance bath (PB) with a preheat exchanger (PWT) is provided for heating the liquid sample (PROBE).

Claim 33 (Currently Amended): The apparatus of claim 32, wherein for carrying out standard calibrations and measurements there a four-way valve (FV) is provided which comprises inputs respectively connected to a vial (A) of standard ~~see~~sea water (SSW), a bottle (B) of sample water (PROBE) and to cleaning and air conduits (H_20, Air).

Claim 34 (Previously Presented): The apparatus of claim 33, wherein a diaphragm pump (MP) is provided for evacuating the measuring cell (MC).

Claim 35 (Previously Presented): The apparatus of claim 34, wherein a dosage pump (DP) is provided for filling the measuring cell (MC).

Claim 36 (Previously Presented): The apparatus of claim 35, further comprising a' computer (PC) for regulating the water bath, controlling the measuring sequence, and storing results.

Claim 37 (Previously Presented): The apparatus of claim 36, further comprising a fully automatic precision balancing bridge for measuring the conductivity of the liquid sample (PROBE).

Claim 38 (Previously Presented): The apparatus of claim 37, further comprising an indicator for signaling satisfied measuring conditions.